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| 09/643,526 | 08/22/2000 | Tongbi Jiang | 303.705US1 | 9708 |

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EXAMINER

BUI, HUNG S

ART UNIT PAPER NUMBER

2841

DATE MAILED: 06/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/643,526

Applicant(s)

JIANG ET AL.

Examiner

Hung S Bui

Art Unit

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-25 is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

1. The indicated allowability of claims 7-15 is withdrawn in view of a different interpretation of the prior art. Rejections based on the new interpretation of the prior art follow.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art shown in figure of Juneja et al. [US 6,127,728] (Juneja et al., hereinafter) in view of Beck [US 2,695,351] and Benzinger [US 3,617,613].

Regarding claims 1-2 and 4, Juneja et al. disclose a circuit board (figure 1) comprising:

- a core layer (22); and
- a surface layer (20) having a surface layer thickness between about 10 and 30% of the circuit board thickness (figure 1, column 1, lines 8-21).

Juneja et al. disclose the instant claimed invention except for the surface layer being free of fibers and the core having at least one fiber.

Beck discloses a multilayer circuit board (10) having a surface layer (11) formed of a resinous material free of fibers (figure 13).

Art Unit: 2841

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use the non fiber material for the surface layer of Juneja et al., as suggested by Beck, for the purpose of facilitating application of circuit traces on the board.

Benzinger discloses a printed circuit board (1) having a core formed of processed fiber glass (column 3, lines 34-45).

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use fiber glass in the resin of the core of Juneja et al. in view of Beck, as suggested by Benzinger, for the purpose of reinforcing/strengthening the printed circuit board.

Regarding claim 3, Juneja et al. in view of Beck disclose the instant claimed invention except for the surface layer being formed of a non-woven glass fiber.

Benzinger et al. disclose the use of non-woven glass fiber (column 1, lines 57-65).

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use a non-woven glass fiber for the surface layer of Juneja et al. in view of Beck, for the purpose of improving board flexibility.

Regarding claim 5, Juneja et al. disclose the use of resin in the core material (column 1, line 18).

Regarding claim 6, Juneja et al. disclose the instant claimed invention except for the specific thickness of the core layer.

Art Unit: 2841

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the core thickness between 0.006 and 0.012 mm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Regarding claims 7-12, Juneja et al. disclose a circuit board (figure 1) comprising:

- a first layer (20) having a thickness between about 10 and 15% of the circuit board thickness;
- a second layer (24) having a thickness between about 10 and 50% of the circuit board thickness; and
- a core layer (22) located between the first and second layers.

Juneja et al. disclose the instant claimed invention except for the surface layer being free of fibers and the core having at least one fiber.

Beck discloses a multilayer circuit board (10) having a surface layer (11) formed of a resinous material free of fibers (figure 13).

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use the non fiber material for the surface layer of Juneja et al., as suggested by Beck, for the purpose of facilitating application of circuit traces on the board.

Benzinger discloses a printed circuit board (1) having a core formed of processed fiber glass (column 3, lines 34-45).

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use fiber glass in the resin of the core of Juneja et al. in view of Beck, as suggested by Benzinger, for the purpose of reinforcing/strengthening the printed circuit board.

4. Claims 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant admitted prior art shown in a figure 1 (AAPA, hereinafter) in view of Juneja et al. and Benzinger et al.

Regarding claims 13 and 16, AAPA discloses a circuit board assembly (figure 1) including:

- a first circuit board (105);
- a second circuit board (103) coupled to the first circuit board; and
- a die coupled to the second circuit board.

AAPA discloses the instant claimed invention except for the specific design of the second circuit board.

Juneja et al. in view of Beck and Benzinger et al. disclose a multiple layer circuit board (2) having a fibrous core with fibers having a diameter in the arrange of 0.2 to 14 microns (abstract lines 5-6) and the surface portion (7) located at a distance between about 10 to 20 percents of the thickness away from the number of fibers.

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use the circuit board design of Juneja et al. in view of Benzinger

Art Unit: 2841

et al. for the second circuit board of AAPA, for the purpose of facilitating mounting of the die.

Regarding claims 14-15 and 17-18, AAPA discloses the instant claimed invention except for the specific type of die mounted on the second circuit board.

Official notice is taken the effect that multiple types of dies could have been used with the circuit board assembly of Juneja et al. in view of Beck and Benzinger et al. for the purpose of using the circuit board assembly for multiple purposes. MPEP 2144.03.

5. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant admitted prior art shown in a figure 1 (AAPA, hereinafter) in view of Juneja et al., Benzinger et al. and Beck.

Regarding claim 19, AAPA discloses a circuit board assembly (figure 1) including:

- a first circuit board (105);
- a second circuit board (103) coupled to the first circuit board; and
- a die coupled to the second circuit board.

AAPA discloses the instant claimed invention except for the specific design of the second circuit board.

Juneja et al. in view of Benzinger et al. disclose a multiple layer circuit board (2) having a fibrous core with fibers having a diameter in the range of 0.2 to 14 microns

Art Unit: 2841

(abstract lines 5-6) and the surface portion (7) located at a distance between about 10 to 20 percent of the thickness away from the number of fibers.

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use the circuit board design of Juneja et al. in view of Benzinger et al. for the second circuit board of AAPA, for the purpose of facilitating mounting of the die.

Beck discloses a multilayer circuit board (10) having a surface layer (11) formed of a resinous material free of fibers (figure 13).

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use the non fiber material for the surface layer of AAPA in view of Juneja et al. and Benzinger et al., as suggested by Beck, for the purpose of facilitating application of circuit traces on the board.

Allowable Subject Matter

6. Claims 20-25 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art of record does not teach or suggest, in the claimed combination, the second circuit board having a first surface located at a first distance of between about 10 to 15 percent of the thickness away from the number of fibers and a second surface located at a second distance of between about 10 to 15 percent of the thickness away from the number of fibers and a die being coupled to the second circuit board.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

Art Unit: 2841

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

7. Applicant's arguments with respect to claims 1-6 and 16-19 have been considered but are moot in view of the new ground(s) of rejection.

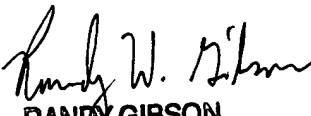
Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung S Bui whose telephone number is (703) 305-8024. The examiner can normally be reached on Monday-Friday 8:30AM-6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David S. Martin can be reached on (703) 308-3121. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0956.

HB
6/19/03


RANDY GIBSON
PRIMARY EXAMINER